Periscope.

a.—ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM.

Functions of the Brain.—At the session of the Soc. de Biologie, November 18th, (rep. in *l'Union Medicale*) Dr. Brown-Sequard exhibited a dog in which he had laid bare and cauterized with a red-hot iron the right cerebral hemisphere. The following phenomena were presented by the animal, closure of the eyelids, pupillary contraction on the right side, and further, a projection of the nictitating membrane on that side. Besides this, there was a paralysis of the limbs on the corresponding side, they were sometimes contracted and sometimes relaxed.

In this case certain phenomena, not met with in all experiments, were observed. Besides the paralysis of the right posterior limb, there was a contraction of the vertebral muscles of the right side and its posterior member. This contraction of the paralyzed side causes considerable hindrance to the locomotion of the animal. After the operation it fell on the well side on account of the rigidity of the opposite one. This contraction, in all respects, is very similar to the spinal epilepsy first observed by M. Brown-Sequard in certain cases of localized dorsal myelitis, and which has since been observed many times. This spinal epilepsy is often accompanied with a very notable contraction, and sometimes the simple traction of the great toe causes this phenomena to disappear. This fact is interesting and has actually been observed in the dog experimented upon. M. Brown-Sequard thinks that in burning the surface of the brain there followed rapidly an alteration of the functions of the cord.

Following out the same line of research, M. Brown-Sequard has seen, after the complete section of the neck of the rabbit, or the ligature of all the large vessels of that region, all the four members seized with convulsions; but if, previous to the operation, we have injured the brain, we sometimes see one of the members remain unconvulsed at the moment of the severance of the neck, and it is that on the side of the cerebral lesion.

Cauterization of the brain has, therefore, a rapid influence on the structure of the cord. According to M. Charcot, the secondary degenerations of the cord are of slow development. On the contrary, they actually are very rapid in their appearance. It is also to be remarked that it is the right side of the brain that has the most influence in the production of these symptoms; the effects are much less marked with lesion of the left side.

M. Brown-Sequard also called attention to the fact that the paralysis of the lower limbs from cauterization of the cerebral surface did not produce the same deviations in the direction of the toes as the section of the great sciatic. Motility may reappear after a while in the paralyzed muscles, but fails to do so in many cases.

A last point, insisted upon by Dr. Brown-Sequard, is the loss of the muscular sense; the animal forgets, in effect, its paralyzed limb.

In the discussion following, M. Hayem asked how soon the paralysis followed the injury. On the answer of Brown-Sequard, that it occurred very rapidly, M. Hayem thought that the phenomena might be due to a meningo-myelitis by rapid propagation of the inflammation from the cerebral membranes to those of the cord, rather than to a nervous lesion, properly speaking. The symptoms described by M. Brown-Sequard were indeed very similar to those of meningo-myelitis.

In reply, M. Brown-Sequard said that according to M. Hayem's view, the same phenomena should appear on the side of the members, which was not the case. Moreover, he did not find inflammation of the meninges.

M. Hallopeau had noticed in a patient suffering from a cerebral hemorrhage, a very rapid loss of reflex action. This symptom followed the next day after the attack. Further, the paralysis was on the same side as the lesion. There might be, therefore, produced a phenomenon of arrest of the action of the cord, very rapid, under the influence of the cerebral lesion, even before the secondary degeneration of the cord could be produced.

M. Dupuy, after section of the great sympathetic, had seen an atrophy of the cerebrum, cerebellum, and the cord of the corresponding side. The brain had been removed four months after the section.

M. Brown-Sequard had already presented examples of the atrophy of the two cerebral lobes after section of the sympathetic nerves. In a guinea pig, he divided only one sympathetic, and there resulted not only atrophy of the corresponding side of the brain, but also atrophy of the eye of the same side.

The same thing occurred in regard to the eye, after cauterization of the brain. But it is difficult to understand why the division of the grand sympathetic produces atrophy of the brain as its consequence. We should have, on the other hand, a hypertrophy of the organ, for section of the sympathetic increases the circulation by vascular dilatation. It is true that M. Vulpian admits that the phenomenon of vascular dilatation is followed by contraction, and hence, anæmia, and he may thus explain this atrophy. But M. Brown-Sequard rejects this explanation and regards this relation between the brain and the section of the sympathetic as paradoxical.

M. Chouppe cited the case of a patient suffering from cervico-brachial neuralgia, on whom he had made a cauterization with the red-hot iron over the superior portion of the dorsal cord. This operation was soon followed by symptoms of a very active congestion in the eye of the side corresponding to the cauterization.

At the session of the Soc. de Biologie, Nov. 27, (Rep. in *L'Union Med.*) M. Brown-Sequard gave a general *résumé* of the lectures delivered by him at Boston last year which have been alluded to in this JOURNAL. He said:

When we study the observations of cerebral lesions in man we find that, with the injuries at the same point the symptoms are sometimes very different, and sometimes there is a complete absence of symptoms. Thus in the case of Abercrombie, the complete destruction of one cerebral lobe caused only a little headache and slight troubles of vision, sensibility and motility of the members remaining intact.

In the presence of such facts, M. Brown-Sequard refused to admit that such and such restricted portions of the brain preside over certain functions, as is held by Gall, Broca, Fritzch and Hitzig.

It is much more probable that the cells which have to do with the same function are scattered throughout the encephelon, that they are connected with each other, but not grouped at a single point. In fact, if we make sections so as to progressively remove the cerebral substance, we sometimes produce no paralytic phenomena. That only follows the total ablation of a hemisphere.

M. Brown-Sequard confirmed by his experiments, the results already known of inflammation of certain parts of the brain. Such for example as the alterations of the lungs and the intestines. He showed how even the most minute lesions, almost invisible in fact, of the brain, in the convolutions as well as at the base may accompany hemorrhages or ulcerations of the viscera.

Following out his researches on cauterization of the brain, he had discovered that the cautery of the same cerebral region in two dogs caused in one paralysis of the anterior, and in the other of the posterior members. The lesion of the same part of the brain may therefore produce different effects. Further, the lesion was unilateral, which shows that an injury of only one side of the brain may produce paralysis on both sides of the body.

M. Brown-Sequard also noted two other interesting facts in one of the dogs experimented upon. They were on the one hand a dilatation of the chest of the side corresponding to the cerebral lesion, and on the other hand the appearance of an epileptogenic zone extending from the chest to the abdomen.

At the same meeting M. Dejcrine exhibited the brain of a dog showing a nearly complete destruction of the right hemisphere. This hemisphere was replaced by a cystic pouch of the size of a clenched hand, having caused on the corresponding side of the cranial vault a considerable protuberance. The cerebral peduncle of the corresponding side, as well as the pyramid of the opposite side, were affected with a very marked secondary degeneration.

During life, and there is the interesting point of the communication, the animal, whose sensibility and motility were very carefully examined, showed no special symptoms and seemed to be in very good health.

At a meeting of the Soc. de Biologie of Dec. 4, (reported as below in *l'Union Medicale*) M. Brown-Sequard recalled the fact that in 1850 he had obtained symptoms of locomotor ataxia in birds from injuring or exciting the gray substance at the origin of the sciatic nerve. He exhibited pigeons in which he had performed the same experiment with like results.

The gray matter at the origin of the sciatic has been very carefully examined by M. Pierret. According to him it is composed in great part of connective tissues and fatty matters, but shows no trace of nervous elements. Hence it follows that it is not the gray nervous substance. How then can the injury of this region induce disorders of co-ordination? How is it there exists at this point so intense a reflex power?

Up to the present time M. Brown-Sequard had thought the reflex excitability would be the greater, the more abundant the gray nervous matter. But he was forced to admit now, since the researches of M. Pierret, that the gray substance just described possessed no nervous elements, and that it had only the appearance without the structure of the gray nervous matter properly so-called.

M. Brown-Sequard was therefore led to believe that it is the dura-mater that presides over co-ordination. Nevertheless, it is possible that this grayish substance plays a part of co-ordination, and that the titubation may be produced under the influence of the excitation of the dura-mater propagated from this substance.

THE COURSE OF THE COLUMNS OF THE CORD THROUGH THE MEDULLA AND PONS. M. M. Sappey and M. Duval, *Gaz. des Hopitaux*, No. 10, Jan. 25.

Three nervous columns form the white substance of the spinal cord. Up to the present, observers have failed to trace these through the medulla and annular protuberance. Our studies have permitted us to fill up this lacuna.

Of the three columns which form the white substance, one is the *antero-internal*, limited internally by the median anterior groove of the cord and externally by the anterior horn. The second, much more voluminous, corresponds to the anterior of this horn, and besides fills all the space between it and the posterior one; it is the *antero-lateral* column. The third or posterior column extends in the transverse sense, from the posterior horn to the posterior median groove.

The *antero-internal* column decussates with its fellow through the whole length of the cord; it therefore takes a very important part in the formation of the anterior commissure. In the medulla and the protuberance the two antero-lateral columns become independent and change their position in such a way that, though anterior in the cord, they occupy in the medulla its central portion and soon appear on its posterior surface. Having become postero-superior they pursue their ascending course, traversing first the protuberance, then the cerebral peduncles, they end in the optic thalami.

The antero-lateral columns decussate at the neck of the medulla. The well-known decussation that we observe here is exclusively formed by these columns. It is produced in the following manner. The two antero-lateral columns bend toward each other, inclining inwards, forwards and upwards, but their decussation is not *en masse;* it is effected by successive and alternate layers from below upwards. The most internal layers approach the central canal encroaching on the anterior cornua at the level of their continuity with the gray commissure. The other layers add themselves to the preceding nearing the median line, still more increasing the encroachment, and these still higher finish it so that the two cornua are soon decapitated. After their discussation the two columns mount parallel to each other on the sides of the anterior median groove, that of the right side occupying the left side of the groove and *vice versa.* At first sight it might seem that they form the whole of the anterior pyramids, but a more careful examination shows very clearly that they form only their superficial portion, that which we call the motor portion of the pyramids.

In their decussation and prolongation to form the motor portion of the pyramids, the two antero-lateral columns push aside the antero-internal ones shoving them to the right and left and soon they cover them up completely. These last, which at the lower part of the medulla are nearly at the periphery, find themselves higher up just behind the anterior pyramid.

The motor portion of the pyramid is remarkable from its fasciculated aspect. From the medulla it enters the pons, passes through its whole length, spreads out largely on the lower surface of the cerebral peduncles and passes on to the corpora striata into the thickness of which it penetrates. The two posterior columns of the cord having reached a point above the decussation of the antero-lateral columns, likewise decussate but only after that of the anterior columns are complete. Then it is seen to bend forwards and change in eleven or fifteen bundles which decapitate the posterior cornua in crossing its deep extremity and turn around the gray matter in front of the central canal of the medulla to carry those of the right side to the left and *vice versa.* Thus decussating, the posterior columns form a large triangular raphe with its base drawn posteriorly, but this raphe soon elongates from behind forward, in passing between the antero-internal columns which it separates, and takes then the shape of a rectangle, the anterior extremity of which in horizontal sections is applied to the motor portions of the pyramids. As soon as the raphe takes this shape, its external extremity divides, and the two resulting branches from this division are in contact with the pyramids. As the decussation progresses, the anterior portion of the raphe takes on more importance, it enlarges and becomes thicker, and when the crossing is complete, the two posterior columns are in contact with the motor portion of the pyramids of which they form the deep layer; this deep layer, very different from the superficial one in appearance, constitutes the sensitive portion of the pyramid.

The posterior columns, therefore, keep in the medulla the same relative situation to the lateral ones as in the cord. They are at first in direct contact with them, but at the termination of the medulla they tend to become independent, and in passing the pons and peduncles, they separate more and more, and at the same time they noticeably change their shape and soon become undistinguishable if not traced along the whole extent of their track.

At the superior extremity of the medulla the motor portion of the medulla is already surrounded with flattened nuclei of gray matter. One of these nuclei corresponds to the deeper portion of the anterior fissure of the medulla; it takes the shape of a triangle, the summit of which is inserted like a wedge between the motor and sensory portions of the pyramids. As these two portions pass into the protuberance the wedge separating passes still further between them; about the lower third of the pons it separates them completely, and between the two previously contiguous surfaces there is a layer of gray matter, and this becoming thicker and thicker the two portions become still more distant from each other and change in appearance. The sensitive portion is especially modified;' it becomes flattened and broader, then it becomes thicker toward the outside, and becomes more and more external. On the cerebral peduncle it corresponds to their external portion; it can be followed to the optic thalami into which it penetrates with the antero-lateral columns.

THE BRAIN OF THE CHACMA BABOON.—Dr. Herbert C. Major, *Jour. of Mental Science*, Jan., 1876, contributes some very interesting microscopic observations on the brain structure of the Chacma baboon. The grosser differences between the brain of man and the quadrumana have been already pointed out by various authors, such as Owen, Huxley, Turner, Gratiolet, Meynert, and the author himself had shown some differences in nerve cells of some of the smaller apes from those of man. The finer brain structure of the higher qudrumana had hitherto been unstudied.

Dr. Major used for comparison the brains of two presumably healthy young men in whom death was the result of an accident, thus excluding any vitiation of the results by the existence of morbid changes caused by lingering illness. He does not state, however, and it would have been better if he had done so, what was the cause and mode of death of the baboon.

The comparison was made of the following three points: 1, the number and appearance of the cortical layers; 2, the general characters of the nerve, and other constituent elements of the strata, including the intimate nature and structure of the nerve cells, the size of the corpuscles, and the number of the cell processes, and the nature and extent of the connections; and 3, the vessels and white medullary substance.

In regard to the first of these points no striking differences were met with, either in the number of the layers, their general appearances and features, and even the modifications of structure noticed in man of the anterior and posterior portions were likewise discernible.

In regard to the form and relative number of the cell-element in the various layers, the brain of the baboon shows no special variation from that of man, nor is there apparently any in the intimate structure of the nerve cells. Dr. Major, however, noticed that a special form of cell, pale, hazy in outline and with large nucleus, is more common in the baboon than in man. The importance of this difference cannot well be stated as it may be accidental.

As to the size of the cells, no positive difference in the two species could be detected, excepting in one part, viz.: the second cortical layer of the frontal and parietal regions, where they are smaller in the ape. The author thinks this, as well as the other fact that the cell processes of this second layer are more numerous and branch more complexly in man, is significant in regard to functions. The fact that these cells are the ones that show most difference as we descend in scale of development, and the first to show degeneration in old age, and that the processes are likewise early to disappear, as well as late in developing, and are generally less developed in the lower animals seems to show that they both have relation with functions.

The third point of inquiry, the structure of the white medullary substance, was investigated but no striking difference was detected. Without doubt it is more abundant in man but beyond this nothing positive could be asserted. Nothing special could be said in regard to the vessels.

THE INNERVATION AND MOVEMENTS OF THE IRIS.—The following are the conclusions of a recent memoir on this subject (*These de Paris*, 1875) by Arsene Debouzy, as given in the *Revue des Sciences Medicales*.

1. The muscular fibres which form the sphincter of the iris and the so-called radiating bundles of the same, are only one muscle, a muscular diaphragm of the eye.

2. When all the muscular fibres of the iris, that is, both the circular and radiating fibres, are put in action at once, contraction of the pupil takes place, on account of the predominance of the circular fibres.

3. This muscular contraction is due to the third cranial or motor oculi nerve alone, and it is only observed in the sensorial functions (accommodation to light and distance, associated movements, etc.,).

4. The dilatation of the pupil that occurs after the cessation of the action of the third pair, is not from excitation of an opposing nerve, nor a muscular contraction; it is solely due to the elasticity of the iris, and is a purely passive phenomenon.

5 The sympathetic has no action on the muscular fibres of the iris, it is purely vaso-motor.

6. When the sympathetic acts as a vaso constrictor, it dilates the pupil. Does it augment the calibre of the vessels? There is then a pupillary contraction. It does not act in the sensorial functions, like accommodation, etc.

7. The phenomena of myosis and mydriasis, depending upon the great sympathetic, are in all respects comparable to the vascular phenomena that produces flushing or pallor of the face.

There exist, therefore, two physiological processes that provoke pupillary contraction: 1. The contraction of the muscular fibres. 2. Vascular dilation.

8. Finally, according to M. Debouzy, the third pair reacts from the optic nerve alone, and is independent of the general sensibility.

When we excite a sensory nerve and obtain a contraction of the pupil, this is the result of a reflex action from the sympathetic with participation of the optic nerve or of the motor oculi communis.

The Vaso-motor Nerves.—The following are the conclusions of a paper by Professors Masius and Vanlair, of Liege, read before the International Medical Congress at Brussels the past year.

1. The vaso-motor nerves are a part of the vegetative nervous system; they have their principal origin in the spinal cord and the medulla; they rise accesorily from the supra-medullary portion of the encephalon, from the sympathetic ganglia situated on the sympathetic cords and distributed in the periphery in the course of nerve fibres.

2. Passing from the spinal cord to the sympathetic, the vaso-motor fibres traverse the anterior roots; they pass to the vessels either in spinal or cranial nerves or accompanying the arteries.

3. The vaso-motor fibres are directed to the muscular coats of the vessels, and they form at their terminations, numerous networks provided with microscopic arteries.

It is not certain that the nervous fibres penetrate into the interior of the cells which constitute the muscular tissue.

4. The influence exercised by the vaso-motor nerves on the calibre of the vessels, is incontestable; of these nerves, some cause when irritated, a constriction of the vessels, others, on the contrary, produce by their excitation, a dilation of the same.

5. The vaso-constrictor fibres and the vaso-dilator fibres are apparently so conjoined in the same nerve that the action caused by the excitation may vary according to the predominance of one kind or the other.

6. The vaso-motor nerves are dependent upon their centres of origin, the activity of which is manifested through their intermediation.

The activity of these centres may be either direct or reflex and may give rise to either vaso constrictor or vaso dilator phenomena.

7. It is necessary to admit the existence of terminal vaso-motor apparatuses in the vascular walls; they are formed by the mycroscopic ganglia. scattered in the network in which the vaso-motor nerves terminate.

These ganglia are little, tonic vaso-motor centres.

8. The vaso-dilators have, for their functions, the moderating the constricting power of these centres and thus augmenting the vascular calibre.

9. The vaso-motor nerves in their course across the cord remain in the half in which they rise.

The influence of the parts of the encephalon, situated in front of the corpora quadrigemina, on the contrary, is crossed.

10. The vaso-motor nerves, from the action that they exercise on the calibre of the vessels, have not only the power to modify the quickness of the sanguine flow, but they act also on the vascular tension, as on the temperature, the coloration and the composition of the blood.

They intervene also in the phenomena of absorption, nutrition and secretion.

The section, which had among its members, physiologists of the highest reputation, among others MM. Marey, Onimus, Frank, etc., gave many sessions to the examination of the many delicate points of this subject, and to M. Masoin, one of the secretaries, was given the task of summing up the definite conclusions accepted by the session and communicating them to the general meeting, September 22, where they were adopted. They are as follows:

The vaso-motor nerves form a part of the vegetative nervous system; they have their origin principally in the cord and medulla; they rise necessarily from the supra-medullary portion of the encephalon, the ganglia of the sympathetic, those scattered through the periphery on the tract of the nerve fibres.

In going from the spinal axis to the lateral cords, the vaso-motor nerves take the course of the anterior roots; they pass to the vessels either with spinal or cranial nerves, or accompanying the arteries.

The vaso-motor nerves in their course across the cord, remain in the half in which they rise.

The influence of the parts of the brain situated above the corpora quadrigemina, on the contrary, is crossed.

In point of view of its physiological composition, we may consider the vaso-motor apparatus as constituted by the principal centres and nervous connecting fibres uniting them to each other. These centres are the cerebro-spinal axis on the one hand, and on the other the collection of nerve cells distributed to the periphery of the vascular system (tonic centres) The connecting fibres are of two kinds, the vaso-constrictors and the vaso-dilaters, in part centripetal and in part centrifugal. Both these kinds of fibres are, doubtless, often united in the same nerve; nevertheless, the vaso-dilator fibres are usually most numerous and active; they relax the vascular walls and diminish the activity of the tonic centres.

Moreover, vaso-constrictor and dilator fibres, starting from the periphery enter the tonic centres, and these again in their turn, give out fibres exclusively constrictor, which spread themselves on the walls of the vessels.

THE FORMATION OF SUGAR IN THE ANIMAL BODY.—The following is a summary of the principal points made in a communication made by M. Claude Bernard to the Acad. des Sciences, January 10th, and reported in the *Revue Scientifique*. It may be taken as a good general *résumé* of our present knowledge on the subject.

The blood of men and animals invariably contains sugar, and this constant glycemia depends on a normal function of the liver. These facts have been established by the experiments of M. Claude Bernard, and those who followed him. The physiological production of sugar in the liver is subject to the influence of the nervous system, and by wounding a particular point in the fourth ventricle, not far from the origin of the vagi nerves, the sugar is developed superabundantly rendering the animal rapidly diabetic; from this arose the discovery of the glycogenic function of the liver. This function only becomes developed at a certain period of intra-uterine life, but sugar is none the less lacking in the organism undergoing evolution. Sugar exists in the allantoid and amniotic liquids, and in the urine, and diabetes is, after a fashion, the normal condition in the foetus. From these facts, M. Claude Bernard considers glycogenesis as a general physiological phenomenon, accompanying all the manifestations of life in animals as well as plants.

Later, the discovery of the glycogenic matter, after a fashion, changes the face of the problem in connecting it with one of the most difficult questions of general physiology, that of the intimate nutrition of the tissues. The theories of nutrition have always allotted to the blood the principal part in the chemical changes that take place in the living organism. But M. Claude Bernard has shown that instead of seeking directly in the blood for the substance preceding the sugar and producing it, it is necessary, on the other hand, to place it in the hepatic tissue itself. The author terminated his communication by relating some interesting experiments that led to this discovery.

THE VASO-MOTOR NERVES OF THE HEAD.—At the International Medical Congress at Brussels, Biological Section, meeting of September 22, M. Masoin read the following conclusions of a memoir by M. Frank, (rep. in *Rev. Scientifique*):

I. The vessels of the head receive their nerves: 1. From free sympathetic filaments coming directly from the ganglia of the chain; 2, from fibres of the same order contained in the mixed spinal nerves, and derived by them from the cord and the ganglia.

II. I. The vessels of the superficial and deep regions of the face are supplied by free sympathetic fibres from the superior cervical ganglia and the prevertebral cord.

2. The vessels of the external ear and of the scalp receive their nerves from the sympathetic, the facial, the trigeminus, the facial and the cervical plexus.

3. The encephalic vessels are innervated:

By the carotid plexus, keeping in mind the physiological signification of the anastomoses of these sympathetic fibres with the cranial nerves; by the vertebral nerve, or rather the vertebral plexus, likewise bearing in mind the anastomoses of the cervical nerves with the cerebral nerves.

THE INNERVATION OF THE UTERUS.—In our April number of last year, we published an abstract of the paper of Goltz and Freusberg on the innervation of the uterus, at the end of which one or two clinical cases illustrating the independence of the uterine contractions as regards the influence of the brain, were mentioned. Drs. Birkerd and Lange, *Hosp. Tidende*, September 22, 1875, (Abstr. in *N. Y. Med. Record,*) give another history of this kind. A young woman, twenty years of age, and advanced eight months in pregnancy, was thrown from a wagon, the box falling across her back; this was followed by paralysis and partial anæsthesia of the lower extremities, paralysis of the bladder and rectum, and considerable hindrance to respiration. There was tenderness over the fifth and sixth vertebræ but no mobility or crepitation.

Labor was induced four days after the injury by vaginal injections of warm water. The os dilated, the membranes ruptured, the head descended, and the delivery was completed by the forceps. The uterine contractions were quite forcible but could only be detected by vaginal examination, the patient being also apparently unconscious of them. No assistance was rendered by the abdominal muscles, and no accidents during delivery. The patient died five days later but no post mortem was made.

THE INNERVATION OF THE TENSOR TYMPANI.—The following are the conclusions of a paper on this subject by Prof. Voltolini, of Breslau, published in *Virchow's Archiv*, LXV. iv. 467.

1. Noticeable and strong contractions of the tensor tympani were incited by irritation of the trigeminus, which can be kept up for a long time in the dead body; the contractions almost always follow the application of a weak, electrical current.

2. The same result follows the irritation of the facial nerve, but almost always only with a powerful current; the irritation is generally soon exhausted.

3. By this contraction of the tensor, the membrana tympani is drawn powerfully inward by the handle of the malleus; this, however, is naturally different in different species of animals: in guinea pigs it is so slight that it can hardly be seen without the use of some mechanical appliance.

4. With this contraction of the tensor and the consequent tension of the membrane, we see *in the dead animal,* the lymph rise in the opened semicircular canals, and fall again on released tension.

5. In no case, neither by irritation of the trigeminus, nor the facialis nor even by mechanical movement of the stapes, was there observed any simultaneous movement at the fenestra rotunda, that is, of the membrana secondaria tympani.

6. Simultaneously with the irritation of the trigeminus and the resulting contraction of the tensor, there is contraction of the palatal muscles, and dilatation of the eustachian tube as the anterior membranous wall is withdrawn from the posterior cartilaginous portion.

The conclusion from all the experiments is, that the tensor tympani is innervated by both the facial and trigeminus nerves.

In addition to the above, the following are some of the papers that have recently appeared upon the anatomy and physiology of the nervous system.

SCHIFF, On the so-called motor centres in the cerebral hemispheres, *Rivista Sperimentale* II. 1876, Jan.; PIETRO and MICHIELI, On the cerebral centres for motion, *Lo Sperimentale*, Feb., 1876; HITZIG, Untersuchungen ueber das Gehirn, neue Folge, *Reichert u Du Bois Reymond's Archiv*, 1875, No. 4.; SACHS, The nerves of the tendons, *Ibid.*; DREHER on the theory of vision, *Ibid.*; COLASANTI, Researches upon the section of the olfactory nerve in frogs, *Ibid.*; RABL-RUCKHARD, Studies on the brains of insects, *Ibid.*; SACHS, On the Sinew Reflex, *Deutsche med. Wochenschr.* No. 5, Feb. 5; MAYS, The physiological cause of the muscular contraction of the gravid uterus. *N. Y. Med. Jour.*, *Feb.*

Abstracts of some of these will be given in the July number of this JOURNAL.